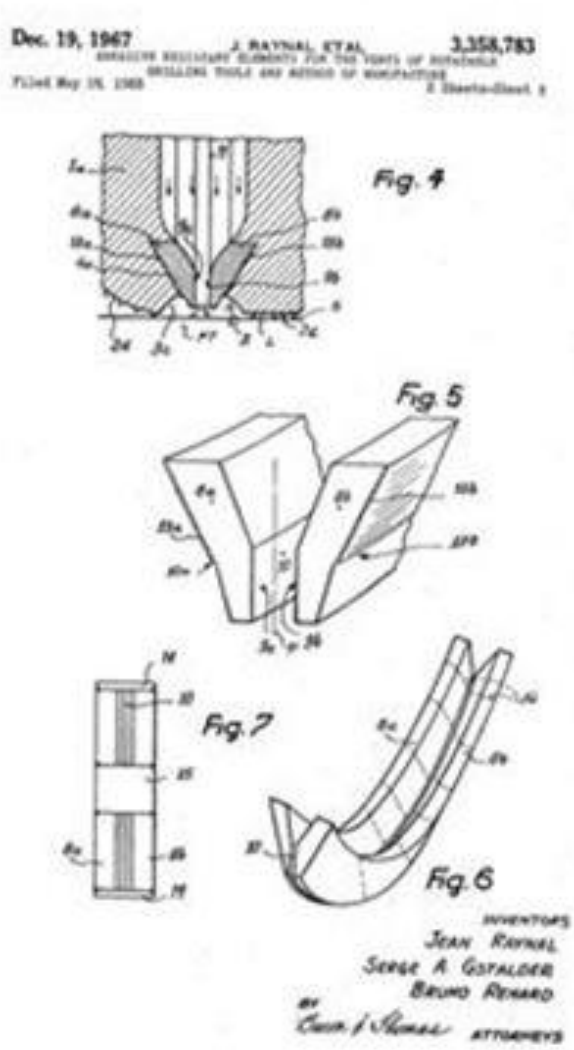
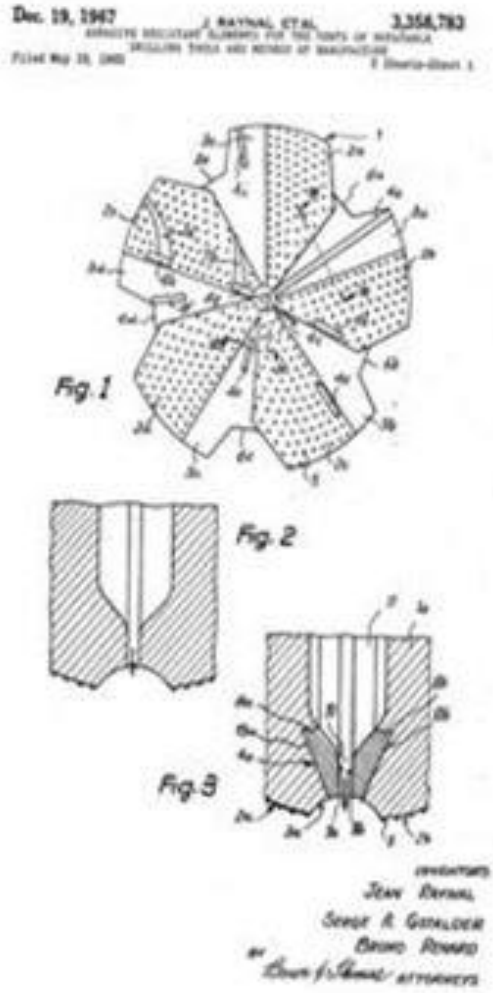
Westward Group Abrasive Tools sale in Paris





Abrasive resistant elements for the vents of rotatable drilling tools and method of manufacture US 3358783 A

Dec. 1967 J. RAYNAL ETAL 3 ABRASIVE RESISTANT ELEMENTS FOR THE VENTS OF ROTATABLE DRILLING TOOLS AND METHOD OF MANUFACTURE Filed May 18, 1965 2 Sheets-Sheet 1 0 0.1000000 op 0\ 8b l3 49b 15a 4a ATTORNEYS Dec. 19, 1967 RAYNAL ETAL 3,358,783

THE VENT ABRASIVE ISTAN LEMENTS FOR F ROTATABLE DR ING TOOLS AND METHOD OF MANU TURE Filed May 18, 1965 2 Sheets-Sheet 2 INVENTORS JEAN R4 YNAL SERGE A. GSTALDEB BRUNO Pamela av O 6m ,1! W ATTOgNEYS United States Patent Ofiice 3,358,783 Patented Dec. 19, 1967 3,358,783 ABRASIVE RESISTANT ELEMENTS FOR THE VENTS OF ROTATABLE DRILLING TOOLS AND METHOD OF MANUFACTURE Jean Raynal, Serge A. Gstalder, and Bruno Renard, Pau, France, assignors to Societe National des Petroles dAquitaine, Paris, France Filed May 18, 1965, Ser. No. 456,772 Claims priority, application France, June 4, 1964, 976,992; Mar. 2, 1965, 7,649 11 Claims. (Cl. 175-393) ABSTRACT OF THE DISCLOSURE A rotatable drilling tool having fluid blades of the full body or ring type with a central input conduit for the passage of drilling fluid under pressure, a head having areas provided with cutting elements and areas without cutting elements alternating with said cutting areas, vents for distributing the drilling fluid opening on to the areas and each being connected to the central conduit; the vents being constituted by elements whose resistance to abrasion is greater than that of the matrix of the tool.

The present invention relates to improvements in rotatable drilling tools having fluid blades, as well as a method of manufacturing a drilling tool of this type.

The invention relates more particularly to rotatable drilling tools having fluid blades of the full body or ring type, comprising a central input conduit or channel for the passage of a drilling fluid under pressure, a head having areas provided with cutting elements, such as diamonds, cutting edges made of tungsten carbide, or even individual cutting blades, and areas without cutting elements, these areas alternating, and the areas without cutting elements being generally located in a rearward position with respect to the areas having the cutting elements, vents for distributing the drilling fluid arranged in the head perpendicularly to said areas, and opening out on to said area provided with cutting elements and/or on the areas without cutting elements, and each connected to the central conduit or channel of the tool.

It is known that the efficiency of such a tool, ie its speed of advance, which is a function of the rotation speed of the tool and of its bearing pressure on the ground, in addition depends on the efficiency of the jet of the drilling fluid which itself depends upon the speed of the drilling fluid at the output of the vent, upon the distance between the lower extremity of the vent and the cutting face, and upon the abrasive properties and the density of the drilling fluid.

In drilling tools of the above mentioned type, the vents do not stand up to the abrasive effects of the drilling fluid for a sufficient time, so that it is not possible to maintain the jet of fluid at a speed corresponding to its maximum efficiency. Moreover, when the vents are situated in the areas having no cutting elements, which areas are generally rearward of the cutting areas so as to allow the drilling fluid to evacuate the swarf and cuttings, the distance between the lower extremity of the vents and the cutting face is sufficiently large so that the efficiency of the jet is further diminished.

The present invention obviates or minimizes all the above mentioned disadvantages and has for a particular object the production of a drilling tool of the above mentioned type, the vents of which have a resistance which is sufficient to allow the use of a speed for the vents, maximum density and abrasiveness of the drilling fluid, compatible with the drilling installation, as well as to permit the arrangement of the vents at a minimum distance from the cutting face, which distance must .be kept for a period which is at least as long as the life of the cutting elements of the areas themselves.

To this end, according to the invention, the vents of the rotatable drilling tool having fluid blades are constituted by elements, the resistance to abrasion of which is greater than that of the matrix of the tool and substantially equal to that of the cutting elements.

The elements constituting the vents are preferably embedded in the matrix and extend to the interior of the fluid input conduit or channel, so as to form at least one part of said conduit or channel in its narrow area, and so

as to protect the matrix up to an area of the conduit or channel where the speed of the drilling fluid is sufficiently low.

The lower end of each of the vents may protrude beyond the surface of the areas without cutting elements, in which areas said vents are arranged, and are located at a distance from the cutting face which is substantially equal to the distance between the corresponding latitudinal line of the areas provided with cutting elements and the cutting face, i.e. at a distance which is substantially equal to the height of the arrangement of the actual cutting elements themselves.